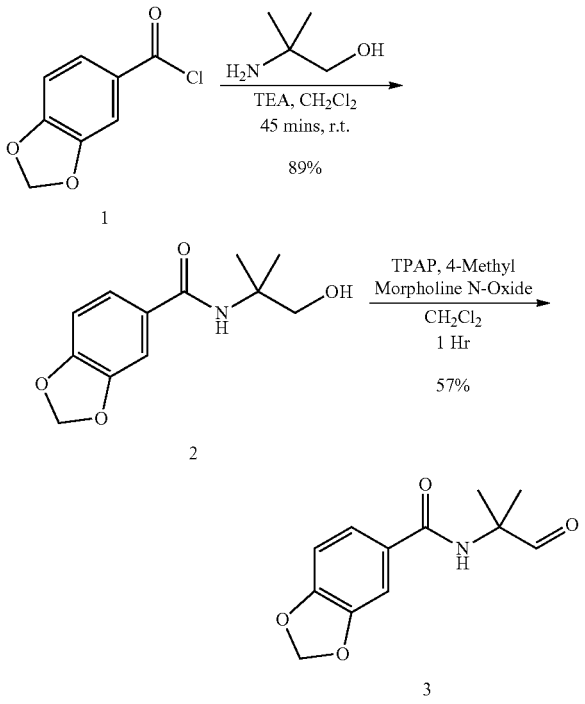
Example 15

[0512]



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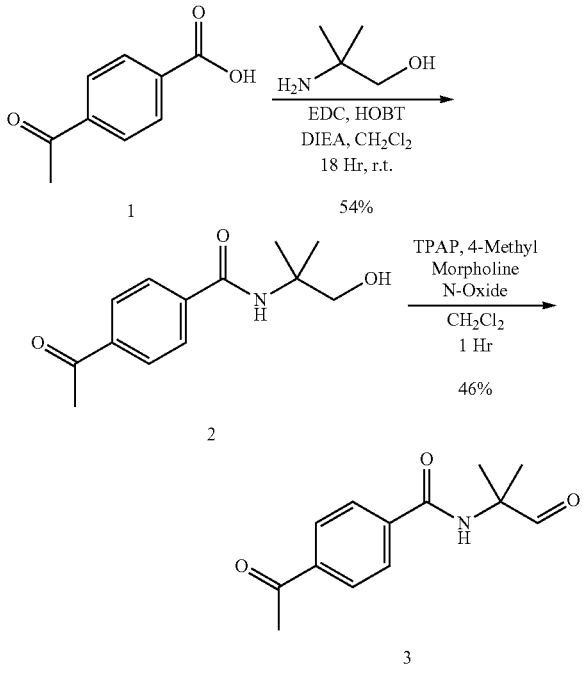
[0513] Piperonyloyl Chloride (1, 7.8 g, 42 mmol) was added to a solution of 2-amino-2-methyl-1-propanol (4 ml, 42 mmol), CH_2Cl_2 (200 mL), and triethylamine (11.7 ml, 84 mmol) at room temperature. The reaction solution was concentrated after 45 minutes, and the resulting residue was diluted with EtOAc (40 mL) and washed with brine (30 mL). The organic layer was dried ($MgSO_4$), filtered, and concentrated to yield a light brown oil. The crude material (2, 8.8 g) was used without further purification.

[0514] Tetrapropylammonium perruthenate (TPAP, 638 mg, 1.8 mmol) was added portion-wise to a solution of 2 (8.6 g, 36.3 mmol), CH_2Cl_2 (73 ml, 2 mL/mmol), 4-methyl-morpholine N-oxide (6.4 g, 54.5 mmol), and molecular sieves, 4 Å activated powder (18 g, 500 mg/mmol) at 0° C. under N_2. The reaction was allowed to warm to r.t. after 15 minutes. After 1 hour the reaction was complete (TLC) and was filtered through silica, eluted with EtOAc (100 mL), and the filtrate was concentrated. This yielded 7 g of off-white solid (3). The material was recrystallized: EtOAc (30 mL), MeOH (10 mL), and Hexanes (1 mL) were added portion wise with heating and sonication. This was brought to a boil after which hexane (100 mL) was added while cooling. Crystals immediately began to precipitate as the solution was cooled. The mixture was filtered and the crystals were washed with hexane (10 mL) to provide 4.88 g (57%) of 3 as off-white fluffy crystals.

Example 16

[0515]



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[0516] A mixture of 2-amino-2-methyl-1-propanol (4 ml, 42 mmol), CH_2Cl_2 (200 mL), 4-acetyl benzoic acid (1, 6.9 g, 42 mmol), EDC (1-(3-dimethylaminopropyl)-3-eythylcarbodiimide HCl, 12.1 g, 63 mmol), HOBT (N-hydroxybenzotriazole H_2O, 6.4 g, 42 mmol), and Hunig's base (diisopropylethylamime, 22 mL, 126 mmol) was stirred at room temperature for 18 hours. Upon completion (TLC, LC/MS) the reaction mixture was concentrated, and the resulting residue was diluted with EtOAc (50 mL) and washed with $NaHCO_3$ (2×40 mL) and brine (40 mL). The organic layer was dried ($MgSO_4$), filtered, and the filtrate was concentrated. The crude material was purified by flash column chromatography (4:1:1 hexanes:EtOAc:CH_2Cl_2; 1:1:1 hexanes: EtOAc:CH_2Cl_2; 1:1 EtOAc:CH_2Cl_2) to remove bisacylated material. Alcohol 2 was obtained in 54% yield (5.36 g).

[0517] Tetrapropylammonium perruthenate (TPAP, 387 mg, 1.1 mmol) was added portion-wise to a solution of 2 (5.36 g, 22.8 mmol), CH_2Cl_2 (46 mL, 2 mL/mmol), 4-methylmorpholine N-oxide (4 g, 34.2 mmol), and molecular sieves, 4A activated powder (11.4 g, 500 mg/mmol) at 0° C. under N_2. The reaction was allowed to warm to r.t. after 15 minutes. After 1 hour the reaction was complete (TLC) and was filtered through silica, which was eluted with EtOAc (100 mL), and the filtrate was concentrated. This yielded 4.4 g of light pink solid (3). The material was recrystallized: 1:1 Hexanes:EtOAc (5 mL), CH_2Cl_2 (20 mL), and MeOH (10 mL) were added portion-wise with heating and sonication. This was brought to a boil after which hexane (100 mL) was added while cooling. Crystals immediately began to precipitate as the solution was cooled. The mixture was filtered and the crystals were washed with hexane (10 mL), affording 2.46 g (46%) of 3 as off-white fluffy crystals.